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NATIONAL DEVELOPMENTS

SCIENTIFIC RESEARCH SYSTEM REFORMED IN SICHUAN

Beijing GUANGMING RIBAO in Chinese 23 Sep 80 p 1

[Article: "Sichuan Province Decides To Reform Further the Present System of Scientific Research"]

[Text] Reporter Li Jiajie [2621 1367 2638] reports that scientific research units of industrial departments and scientific research units concerned mainly with applied research are gradually putting into effect a changeover to an enterprise-oriented system of management. Specialized research institutes where techniques are applied and enterprises are forming combined companies, enabling the institute to become the company's technical development department. This represents a decision made most recently by the Sichuan Provincial OCP Committee to change the presently operating system of scientific research--a system that is not advantageous for bringing into full play the enthusiasm of scientific research units.

The reform carried out by the Sichuan Provincial OCP Committee on the system of management of scientific research was proposed on the basis of experience gained from giving the province's scientific research units as a whole more autonomy. Based on the Central Committee principle that scientific research is a necessary precursor to building the economy, and in accordance with the specific suggestions of the provincial science committee, the Sichuan Provincial OCP Committee decided to select scientific research units that have comparatively good conditions and, at the same time as carrying out pilot projects in changing over to an enterprise-oriented management, adopted the following measures, advanced and promoted the scientific research units' attempt to broaden its autonomy, and attained the objective of realizing a reform of the system of scientific research as quickly as possible:

First, research institutes (including research units of the national defense industry and institutes of higher learning) themselves have the right to select specialized factories suited to the work intended and, following consultations, to put into effect combined management under the conditions that have been laid down. The factory is responsible for the tasks of carrying out the intermediary testing and formally going into production, based on the research results obtained by research institutes; the institutes are responsible for providing the factory with results of the research and with suggestions for new products, and for directing the factory in proceeding with the remaking of its technology.

Second, specialized scientific research institutes can, according to the reforms of our economic system, enter into a combined company organized by an enterprise in their own field, becoming the company's technical service department.

Third, in matters of scientific research, technical servicing, scientific and technological intelligence, and the production of new, or scarce items [the reform] will break down the barriers between the people as a whole and the collectives, the Central Committee versus the various areas, between military and civilian units, between institutes of higher learning and scientific research units, among scientific research units, and between scientific research units and production units or schools. This will allow the natural advantages of each unit to be brought into full play, making use of the best that each has to offer and developing coordination among them.

Fourth, the banks will grant loans to the scientific research units. The specific method is for the banks to give support by providing funds to scientific research projects of a developmental nature that are definitely able to go into production within a short period of time, that will derive an economic income from the production unit, and that can guarantee repayment of the loan on time.

Fifth, after experience is gained from the pilot projects, scientific and technical personnel can be allowed to operate within a specified sphere. This represents a thorough change from the management of scientific and technical personnel in the past, in which their duties were very specific, and particularly is a change as regards scientific and technical personnel being the common property of all. Thus, if an individual unit does not have need of someone's expertise, the unit will be prevented from not making his services available to others. During the pilot phase, scientific and technical personnel from the scientific research units, engineering and technical personnel from the production units, and teaching personnel from the schools will be allowed to work at each other's facilities or be employed by each other as advisers. One might also, without changing one's address registration, receive an appointment to take on scientific research, technical work, or teaching work in an outlying area.

9634

CSO: 4005

LOVE SCIENCES

PLASTIC HEART TRICUSPID VALVE SURGERY SUCCESSFUL

Shanghai JIEFANG ROAD in Chinese 9 Aug 80 p 1

[Text] On 29 July surgery was performed on a patient suffering from severe rheumatic heart disease and repeated heart failures by the surgeons of the Zhongshan Hospital of Shanghai First College of Medicine and the Department of Heart Surgery of the Shanghai Municipal Institute of Cardiovascular Diseases. The surgeons succeeded in using biological valves they themselves made to replace the mitral valve, the aorta valve, the tricuspid valve, and the tricuspid valvular membrane for this patient. After the surgery, the patient quickly recovered and was able to move about on the third day.

The patient is a 35 year old man, having suffered from rheumatic heart disease for 22 years. His condition was increasingly critical in the past 5 years. Heart failure occurred regularly and he had lost all ability to work. For a long time, he depended upon cardiochlorides and diuretics to live. When he entered the hospital, his face was dark and black. His liver was enlarged and his lower limbs were swollen. He suffered from ascites and was unable to lie on his back or to get out of bed and move about. X-rays indicated obvious enlargement of the heart. The clinical diagnosis was rheumatic heart disease. Stenosis and incomplete closure were present in both the mitral and the tricuspid valves. Under the condition of ineffective treatment with drugs, and following abundant preparation, the surgeons decided to replace his diseased tricuspid valve.

On the morning of 29 July, under general anesthesia, the heart surgeons opened the patient's chest cavity and performed the surgery under extracorporeal circulation. The diseased mitral valve was removed from the left ventricle and a biological valve 30.5 mm in diameter was used as a substitute. Then, biological valves 21.5 mm and 31.5 mm in diameter were used to replace the diseased valve of the aorta and the tricuspid valve. Close coordination among those who performed the surgery caused the operation to proceed very smoothly and the heart beat began to recover 85 minutes later. Replacement of the three valves was completed in 110 minutes and the extracorporeal circulation ended after 144 minutes. After surgery, the patient's health was restored quickly. His condition was satisfactory and the murmur in the various valvular regions all disappeared. The symptoms of ascites, pain of the liver, etc were all gone. On the third day after the surgery, he was able to get out of bed and move about.

The heart is a dynamic pump of the human body. The mitral valve, the aorta valve, the tricuspid valve, and the valve of the pulmonary artery function through their opening and closing to guarantee the normal circulation of blood. When the valves

are diseased, aortic valve and thrombotic disease cannot so affect the function of the heart.. From the end of 1977 to July 1980, the Department of Heart Surgery of Zhongshan Hospital used biological valvular membranes to replace, successfully, the valves of 144 patients.. Of the group, both the aortic valve and the mitral valve were replaced for 14 patients to provide and accumulate considerable experience in multiple valve replacement surgery.. In the case reported here, surgery to replace three valves for a critically sick heart disease patient was again a success to open up a new way to save patients of multiple valve diseases.

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CHD: 4008

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CSD: 4008

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9498

CS9: 4008

Electronics

AUTHOR: ZHENG Pengyi [6774 7364 5065]

ORG: None

TITLE: "The HA1166 Integrated Line Scanner Circuit"

SOURCE: Beijing WUXIANDIAN [RADIO] in Chinese No 11, 25 Nov 80 pp 1-3

ABSTRACT: The HA1166 integrated line scanner circuit consists of an oscillator, a device for converting the sawtooth wave oscillator output into square wave pulses, an automatic frequency control unit and an internal voltage regulator. When the input voltage falls from 12 to 9 volts, the internal voltage varies by less than 0.1 volts. This makes possible isolation of the power supplies for the oscillator and the AFC frequency monitor and of both of these from the power amplifier's power supply, preventing interference and simplifying the filter circuit. The sawtooth wave produced by the oscillator is converted by a Schmitt trigger circuit to the square wave pulses required at the output. A circuit diagram of the unit is provided and the functions of the individual components described in detail.

AUTHORS: DU Chaoming [2659 2600 2494], CHEN Jianpeng [7115 0256 7720]

ORG: None

TITLE: "Production of a UHF Converter"

SOURCE: Beijing WUXIANDIAN [RADIO] in Chinese No 11, 25 Nov 80 pp 6-9

ABSTRACT: Owing to crowding on the VHF channels, China has decided to make use of UHF channels 13 through 56 (470-868 MHz). In order to make it possible to receive some UHF channels on VHF sets, a converter has been designed. The converter first converts the UHF signal to a VHF signal, which it then feeds to the television set's ordinary VHF signal processing unit. The UHF converter consists of a signal divider, a high frequency amplifier, a wave mixer, an oscillator and a bypass switch for use when receiving VHF. A circuit diagram is provided and the nature of the individual components, particularly the inductances and capacitances, is described. Detailed instructions for adjusting the unit are given.

AUTHOR: LIN Yong'en [2651 3057 1869]

ORG: None

TITLE: "Improvements in the Integrated-Circuit DYC-II Audio Amplifier"

SOURCE: Beijing WUXIANDIAN [RADIO] in Chinese No 11, 25 Nov 80 pp 10-13

ABSTRACT: The DYC-II audio amplifier uses two integrated circuit modules, the 5G922, which functions as a tone control, and the 5G37, which is used as a power amplifier. Although the tone quality is good, the number of components small and assembly and adjustment easy, certain problems have arisen, for which correction techniques are offered. There are several types of self-excitation. A "tooting" type is corrected by adding an RC circuit across the speaker terminals; a "peeping" type is corrected by adding a capacitor between one of the terminals of the 5G37 and ground. Motorboating is corrected by addition of either a capacitor or triode to the circuit. Another capacitor is added to reduce static. The circuit sometimes becomes blocked because of incompatible voltage characteristics of the two integrated circuit modules; a reconnection to assure sufficient voltage for the 5G922 unit is suggested. Three approaches to decreasing induction between the potentiometer case and leads are suggested. A resistor value change is suggested in order to increase the dynamic range of the output stage. In addition a rewiring to prevent the output signal from feeding back through the power supply resistance into the input is detailed. A diagram of the printed circuit with all of the wiring changes made is included.

AUTHOR: XU Zhibang [1776 3112 6721]

ORG: Shanghai No 16 Semiconductor Components Plant

TITLE: "The BTL Integrated Circuit Power Amplifier"

SOURCE: Beijing WUXIANDIAN [RADIO] in Chinese No 11, 25 Nov 80 pp 20-21

ABSTRACT: A BTL (balanced transformerless) power amplifier is a bridge-type push-pull amplifier which has the advantage of rather high output power at a low voltage, 2-3 times that for an OTL amplifier under the same conditions, with better frequency response and fidelity than an OCL at the same amplification, with fewer additional components required. Two transistors rather than 1 are used for both the push and pull sides, making it possible to obtain twice the potential and 4 times the power across the load. Such an amplifier can be constructed from printed circuit modules such as the SL-37, whose circuitry is shown. A sample circuit using two SL-37's is diagrammed and constraints on the values of the various components discussed. In the circuit given, with a load resistance of 8 ohms, as V_{CC} varies between 9 and 18 volts, P_{max} varies between 1.5 and 7 watts. The main characteristics of other SL series components are given on the inside back cover.

AUTHORS: QI Junchao [2058 0193 6389], TONG Zhiguang [0157 1807 1639], LIU Chongli [0491 1504 4409]

ORG: Dongfeng Radio Plant, Beijing

TITLE: "The Huanqiu No 41 Pocket Radiotelephone"

SOURCE: Beijing WUXIANDIAN [RADIO] in Chinese No 11, 25 Nov 80 pp 24-25

ABSTRACT: The Huanqiu 41 is a single-frequency simplex amplitude modulated wireless radiotelephone which operates at a frequency of 27 MHz with a radiative power of 100-300 milliwatts and has a range of 1-2 kilometers. Its low frequency amplifier is used for both the input and output circuits, and the speaker doubles as a microphone. The device has a 1.5 meter antenna and uses 8 GNY0.45 alkaline batteries (0.45 ampere-hour nickel-cadmium batteries). A circuit diagram and PC board layout are given. Assembly and adjustment procedures are given.

AUTHOR: None

ORG: None

TITLE: "Main Characteristics of the BT31, BT32 and BT33 Unijunction Transistors"

SOURCE: Beijing WUXIANDIAN [RADIO] in Chinese No 11, 25 Nov 80 p 32, inside front cover

ABSTRACT: The BT31, BT32 and BT33 unijunction transistors differ in their packaging, which governs the power dissipation capability. The BT31, in a ceramic package, is rated at 100 mW, the BT32, in a B-1 metal case, is rated at 250 mW, and the BT33, in a B-3 metal case, is rated at 400 mW. The B in the designation stands for "semiconductor," the T for "special"; 31, 32 and 33 are serial numbers, and they may be followed by a letter indicating the specific standard. The transistors are manufactured in semiconductor components plants in 10 cities in China. A table showing the appearance and characteristics of the BT series transistors is given.

8480

CSO: 4009

Engineering

AUTHOR: DING Dajun [0002 1129 6874]
JIN Zhisheng [6855 5365 3932]
HUANG Defu [7806 1795 1381]
PANG Tonghe [1690 0681 0735]

ORG: None

TITLE: "An Experimental Study of Ceramsite Concrete Beams"

SOURCE: Nanjing NANJING GONGXUEYUAN XUEBAO [JOURNAL OF NANJING INSTITUTE OF TECHNOLOGY], Civil Engineering Edition in Chinese No 3, 1980 pp [1]-14

TEXT OF ENGLISH ABSTRACT: This study presents the measured results during the whole process of deformation and also the values of cracks and ultimate strengths of 40 reinforced ceramsite concrete beams of a rectangular section under short-term loading. The curves showing the whole process of strain, curvature and deflection in four beams are given as examples. In a table, the measured values of deflection and crack width of the 40 beams under one stage of loading are given. The authors suggest formulas for calculating stiffness and cracks similar to those recommended in the current Code. The results calculated by the proposed formulas agree satisfactorily with the measured values. The test results of moments at first cracking and the ultimate strength are also given. Finally, curves showing the increase of deflection and crack width with time of six beams under long-term loading sustained for three months are presented, and predictions of their final values are also made.

AUTHOR: LAN Zongjian [5663 1350 1696]
JIANG Yongsheng [5592 3057 3932]

ORG: None

TITLE: "Experimental Investigation and Design Calculation of Strength of Reinforced Concrete Members under Biaxially Eccentric Loads"

SOURCE: Nanjing NANJING GONGXUEYUAN XUEBAO [JOURNAL OF NANJING INSTITUTE OF TECHNOLOGY], Civil Engineering Edition in Chinese No 3, 1980 pp 15-25

TEXT OF ENGLISH ABSTRACT: In this paper an experimental study on the ultimate strength of reinforced concrete columns under biaxially eccentric loads is briefly presented. A new formula for computing the ultimate strength of the above-mentioned columns is proposed based upon experimental data which were obtained by the authors and other investigators. The new formula can be used conveniently not only to check the strength of a given member section, but also to select the sectional areas of steel.

AUTHOR: LU Zhitao [0712 1807 3447]
ZHOU Minghua [0719 2494 5478]
CHEN Youwen [7115 0645 2429]

ORG: None

TITLE: "An Experimental Study of Shear Strength of Reinforced Concrete Members with Ring-Section in Bending"

SOURCE: Nanjing NANJING GONGXUEYUAN XUEBAO [JOURNAL OF NANJING INSTITUTE OF TECHNOLOGY], Civil Engineering Edition in Chinese No 3, 1980 pp 26-31

TEXT OF ENGLISH ABSTRACT: This paper presents the results of shear tests on 14 reinforced concrete flexural members with ring-sections. The parameters in the series include: amount of longitudinal reinforcement, amount of transverse reinforcement, shear span-to-depth ratio, thickness of tube wall and strength of concrete. Based on the test results, and compatible with the code system, two approaches for calculating the shear strength of reinforced concrete flexural members with ring-sections are proposed.

AUTHOR: JIANG Yongsheng [5592 3057 3932]
LAN Zongjian [5663 1350 1696]
FENG Jiyin [7458 4764 1377]

ORG: None

TITLE: "An Experimental Study of Aseismic Behavior at Beam Ends of Reinforced Concrete Frame Joints"

SOURCE: Nanjing NANJING GONGXUEYUAN XUEBAO [JOURNAL OF NANJING INSTITUTE OF TECHNOLOGY], Civil Engineering Edition in Chinese No 3, 1980 pp 32-39

TEXT OF ENGLISH ABSTRACT: An experimental study of the aseismic behavior at beam ends of reinforced concrete frame joints including monolithic connections, key-jointed connections and corbel-jointed connections is carried out. The design of the joint should obey the principle of "strong column and weak beam" so that all plastic hinges are developed at the beam ends. For the full development of beam ductility, different kinds of anchorage of beam reinforcements in the joint core and groove welded connections on longitudinal main beam bars for precast joints are investigated.

AUTHOR: QIAN Kunrun [6929 2492 3387]

ORG: None

TITLE: "Applications of Critical Path Method in Tall Building Construction"

SOURCE: Nanjing NANJING CONGJUEYUAN XUEBAO [JOURNAL OF NANJING INSTITUTE OF TECHNOLOGY], Civil Engineering Edition in Chinese No 3, 1980 pp 40-50

TEXT OF ENGLISH ABSTRACT: In this paper, a discussion on the applications of the Critical Path Method in tall building construction is presented. The major parts of this paper are concerned with optimization of the construction period and economization of manpower and material resources, consecutive chain procedure of network, modifications of network, network applicable to the tall buildings where construction and business are going on at the same time, network resolved by means of computers and the practice of the CPM, etc. Finally some suggestions on the applications of the CPM in construction, taking into consideration the practical conditions in this country, are proposed.

AUTHOR: GENG Xueyan [6772 1331 6874]

ORG: None

TITLE: "Analysis of Load Stresses in Rigid Pavement by Finite Element Method"

SOURCE: Nanjing NANJING CONGJUEYUAN XUEBAO [JOURNAL OF NANJING INSTITUTE OF TECHNOLOGY], Civil Engineering Edition in Chinese No 3, 1980 pp 51-64

TEXT OF ENGLISH ABSTRACT: After briefly introducing the general concept of computation of load stresses in rigid pavement by using the finite element method in displacement model, this paper presents a method of treatment of foundation reaction which is different from that used by S. K. Wang and Y. K. Chueng.

The author points out that the concentrated reaction assumed by S. K. Wang and Y. K. Chueng is not consistent with the principle of static equivalency in load transposing, and the division of blocks of foundation reaction is inadequate. In stress computation, the author uses a uniformly distributed reaction instead of a concentrated reaction. The result of computation shows that the uniformly distributed reaction is more reasonable than is the concentrated reaction.

In addition, the results with circular-shaped and square-shaped uniform loads of the same area have been compared. It is shown that they are identical.

AUTHOR: WANG Jinyan [3749 4855 3508]

ORG: None

TITLE: "A Device for Measuring the Radius of Curvature of Road Pavement"

SOURCE: Nanjing NANJING CONGHEYUAN XUEBAO [JOURNAL OF NANJING INSTITUTE OF TECHNOLOGY], Civil Engineering Edition in Chinese No 3, 1980 pp 65-73

TEXT OF ENGLISH ABSTRACT: In this paper, the instruments and methods used in China today for measuring the radius of the curvature of flexible pavements are reviewed, and their advantages and disadvantages are discussed. The author proposes two types of instruments for measuring the radius of curvature of the pavement. Both of them are designed according to the principle of the Benkelman beam deflectionometer. One set of each type of the instrument was made, and measurements in the field were taken with them. It is shown that the second type of instrument is better than the first one, and is therefore recommended by the author.

AUTHOR: CHENG Wenrang [4453 2429 3475]

ORG: None

TITLE: "Tables of Coefficients for Calculating Internal Forces in Helical Staircases Simply Supported at Two Ends"

SOURCE: Nanjing NANJING CONGHEYUAN XUEBAO [JOURNAL OF NANJING INSTITUTE OF TECHNOLOGY], Civil Engineering Edition in Chinese No 3, 1980 pp 74-91

TEXT OF ENGLISH ABSTRACT: For helical staircases simply supported at two ends with horizontal angles of rotation of 90° , 270° , 240° and 210° respectively, the internal force coefficients are given in tables. Using these tables will simplify the calculation and aid in avoiding mistakes.

AUTHOR: SUNG Guoding (0002 0948 5120)

ORG: None

TITLE: "Optimum Design of Sand Drains by Nomographs"

SOURCE: Guoping WAXING CONSTRUCTION METHOD (JOURNAL OF WAXING INSTITUTE OF TECHNOLOGY), Civil Engineering Edition in Chinese No 3, 1980 pp 92-99

TEXT OF ENGLISH ABSTRACT: In this paper, a set of nomographs is designed to facilitate the planning of ground improvement by sand drains according to the theory of consolidation of soil. Tedious numerical calculations are avoided and different plans of sand drains can be easily obtained, among which the optimum design is to be ascertained. When the soft soil layer to be improved is of varying thickness, in order to attain the same degree of consolidation during the same specified time interval a large number of calculations is required by the ordinary method, while it becomes quite simple by using the nomographs given. A numerical example is given for illustration.

9717

CS00 4009

Industrial Robots

AUTHOR: Wu Gang [1966 CHINA]

ORIG: None

TITLE: "Industrial Robots at the Computer Belt"

SOURCE: Beijing JIAOYANG [JIAOYANG] in Chinese Vol 1 No 12, 26 Dec 66 pp 20-23

SUMMARY: Industrial robots consist of 3 components: the "hands," control unit and drive unit. Modern robots are computer-controlled. Some can be "taught" the operations they are to perform by guiding them through the motions. A major consideration of many robots is the limited range of capabilities of the hands. Newer robots will have a series of interchangeable hands, which they can change themselves. In order to be useful in modern production, robots must have increased reliability and versatility; the latter will be achieved by equipping them with various optical and other sensors. A major problem to be overcome is that of signal processing in robotized systems. The next generation of robots will be "intelligent" devices capable of decision making. Among the advantages of robots is that they can work in various difficult, uncomfortable or dangerous conditions.

AUTHOR: Guo Junqian [1967 CHINA 2000]

ORIG: None

TITLE: "Debate Over the Nuclear Boiler"

SOURCE: Beijing JIAOYANG [JIAOYANG] in Chinese Vol 2 No 12, 26 Dec 66 pp 24-26

SUMMARY: Light water reactors such as the pressurized water reactor have been predominant in world reactor construction since the early days of nuclear power. But heavy water reactors such as the Canadian CANDU became competitive during the 1960's. The heavy water reactor can use unenriched "natural" uranium as fuel, because the heavy water does not absorb neutrons as readily as light water; in addition, it can be continuously refueled. The light water reactor has a smaller size and simpler operation, since continuous refueling is not used. A controversy exists between these types rather than pursuing both at the same time, because each type requires major investment for the light water reactor, in expensive uranium enrichment plants and heavy equipment manufacturing plants. For the heavy water reactor, in heavy water production plants and pressure manufacturing plants for the refueling facilities. In China, reactors will be used in the energy-poor Northwest and Southwest. In addition to choosing between light and heavy water reactor types, China should also pursue work on fast neutron breeder reactors and high-temperature gas-cooled reactors.

ATTENTION: None

ORIG: None

SOURCE: "A In-Out-Through Solar Hot Water Heater"

REFERENCE: Beijing KONGWANGHUA (MODERNIZATION) in Chinese Vol 2 No 112, Dec Dec 80
pp 11-12

ABSTRACT: A in-out-through solar hot water heater system is described. A ball valve controls the water in the storage tank, and circulation through the collector is in the natural convection process. Steel plate and steel pipe are used; sand-blasted surfaces are used at the top and bottom; the pipes connecting them are coupled with rubber tubing. Single or double glazing with glass is recommended. Instructions for finding the optimal angle of inclination of the collector and for positioning it relative to the storage tank are given.

DATA:

END: 4000

AUTHOR: HUANG Zhen [1970 4371 3784]

ORG: Department of Physical Oceanology

TITLE: "The Analytical Method of the Ideal 'Wave-Surface'"

SOURCE: Qingdao SHANDONG HAIYANG XUEYUAN XUEBAO [JOURNAL OF SHANDONG COLLEGE OF OCEANOLOGY] In Chinese Vol. 10 No. 4, Dec 80 pp 3-12

TEXT OF ENGLISH ABSTRACT: The ideal analytical method presented in this paper is a method which is developed based on the semi-graphical method, making use of actual data of the wave. Magnitudes of actual heights at 720 non-integral hours which are taken from the ideal "wave-surface" are used for the analysis. These magnitudes of actual heights have been calculated in accordance with the coordinates of these points and by means of a formula of the interpolation. First the magnitudes of actual heights are divided into the species of the tide, and then the harmonic constants for 72 constituents are calculated strictly in accordance with means of the least square method. According to the analysis of this section, better results are obtained, for example, the mean squared error is calculated to be 2.7% as at the typical station.

AUTHOR: GUAN Jun [1970 4395 3861]

ORG: Department of Marine Physics

TITLE: "Determining the Optical Parameters in Bragg Model LIDAR"

SOURCE: Qingdao SHANDONG HAIYANG XUEYUAN XUEBAO [JOURNAL OF SHANDONG COLLEGE OF OCEANOLOGY] In Chinese Vol. 10 No. 4, Dec 80 pp 13-26

TEXT OF ENGLISH ABSTRACT: The effects of parameters of an optical beam splitter on Doppler signals in a dual beam LIDAR were discussed, and the formulae for these effects were given. The effect on signals caused by the influence of different ratios of fringe separation to diameter separations to diameters of scattering particles was calculated by the author. It showed a great difference between the round cross section of particles and the square cross section calculated by others previously.

First the example of designing a laser sea current meter, the method selecting the optimal period of fringe with respect to matching the diameter of the scattering particles was recommended. Finally, a configuration in which these parameters could be adjusted independently was introduced.

AUTHOR: LIU Dengng [06426 1795 2496]
LIU Jijiang [06426 1823 1627]

ORIG: LIU Dengng of the Department of Marine Physics; LIU Jijiang of the Mathematics Department

TITLE: "Calculation Method of Equivalent Mass of Transducer with Perforated Structure"

SOURCE: Qingdao SHANDONG HAIYANG XUEYUAN XUEBAO [JOURNAL OF SHANDONG COLLEGE OF OCEANOLOGY] in Chinese Vol. 10 No 4, Dec 80 pp 25-32

TEXT OF ENGLISH ABSTRACT: The use of a perforated structure can increase the transducer bandwidth, which is a new theoretical problem in designing transducer devices. This paper indicates that the decreasing of equivalent mass that arises from drilling holes in the radiating block of the transducer is the main cause of the transducer having greater bandwidth.

The drilling of holes in the radiating block to solve vibration velocity distribution using the usual method is difficult. In this paper we use the finite element method to obtain the numerical solution of vibration velocity and to calculate the equivalent mass and bandwidth of the transducer. The mentioned method can be used in calculating equivalent mass of piezoelectric sandwich or complex transducer along axis perforation in front of the radiating block or in the middle of the radiating block.

AUTHOR: ZHOU Huan [0719 1367 3030]
QIAN Jianying [0783 1824 5391]
GU Ruwei [0769 1843 2429]
et al.

ORIG: ALL of the Department of Marine Chemistry

TITLE: "Marine Geochemistry III. The Chemical Processes of Mercury in Seawater and the Seawater-Sediment Mercury Interchange"

SOURCE: Qingdao SHANDONG HAIYANG XUEYUAN XUEBAO [JOURNAL OF SHANDONG COLLEGE OF OCEANOLOGY] in Chinese Vol. 10 No 4, Dec 80 pp 33-41

EXCERPT FROM ENGLISH ABSTRACT: In this paper, the concentrations of total Hg, inorganic Hg, methyl-mercury in seawater, and those adsorbed on particulate matter in water samples taken from 15 coastal sites of Jiao Zhai Bay near Qingdao have been determined and reported. In addition, a laboratory experiment of seawater-sediment interchange of Hg has been performed. Interesting results are obtained.

AUTHOR: HUANG Weiwen [[7806 5633 2629]]
HE Chengli [[6378 1504 0048]]
LI Huiqiang [[2621 4895 2837]]
et al.

ORG: All of the Department of Marine Chemistry

TITLE: "Determination of Arsenic in Seawater by Anodic Stripping Voltammetry"

SOURCE: Qingdao SHANDONG, HAIYANG XUEYUAN XUEBAO [[JOURNAL OF SHANDONG COLLEGE OF OCEANOLOGY]] in Chinese Vol 10 No 4, Dec 80 pp 422-421

TEXT OF ENGLISH ABSTRACT: A method for the determination of arsenic (III) and total arsenic in seawater by anodic stripping voltammetry was investigated. By the simultaneous deposition of gold and arsenic directly onto the glassy carbon electrode, arsenic (III) was determined. The successful procedure for the determination of arsenic (V) involved digesting by H_2SO_4 and reducing arsenic (V) to arsenic (III) by using Na_2SO_3 as the reducing agent. Then the total arsenic was determined, the detection limit being 3×10^{-10} M. The recoveries for As (III) and As (V) were 106 ± 4 percent and 101 ± 10 percent respectively. The satisfactory reproducibility was obtained only after a sample was pretreated by heating.

AUTHOR: LIUO Chengyi [[675 2110 5030]]
LI Yongqi [[2621 3037 4888]]

ORG: Both of the Department of Marine Biology

TITLE: "Influence of the Sheng-shi Grade Oil on the Early Development of the Scallops Chlamys farreri (Gmelin of Preston)"

SOURCE: Qingdao SHANDONG, HAIYANG XUEYUAN XUEBAO [[JOURNAL OF SHANDONG COLLEGE OF OCEANOLOGY]] in Chinese Vol 10 No 4, Dec 80 pp 522-59

TEXT OF ENGLISH ABSTRACT: The embryonic and larval stages of the scallop Chlamys farreri (Gmelin of Preston) were exposed to the water-soluble fraction (W6SF) of the Sheng-shi oil in seawater. Survival, growth and development rates were observed.

Sensitivity of the sperms and eggs to the W6SF was higher than that of the embryos at cleavage, 10-hatch and gastrula stages, and the sensitivity of the embryos was higher than that of the larvae. The embryos at the gastrula stage showed a 24 h LD_{50} value of about 0.17 percent, and the straight-hinge larva (D form) of about 0.26 percent. The umbro-stage larvae in 11 percent W6SF showed no mortality within 26 hours, and at the end of 48 hours the mortality was about 29 percent.

[Continuation of SHANTONG HAIYANG XUEYUAN XUEZHAO Vol 110 No 44, Dec 80 pp 522-599]

Though the low concentration of W5F did not cause immediate deaths of the embryos and larvae, it obviously did retard the development of the embryo and affected the activity of the larvae.

9117

CS99: 44009

Shipbuilding

AUTHOR: JI Hong [4764 5725]

ORG: None

TITLE: "Electricity, A Ship's Life Fire"

SOURCE: Beijing JIANCHUAN ZHISHI [KNOWLEDGE OF SHIPS] in Chinese No 8, 20 Nov 80
pp 10-11

ABSTRACT: Electricity is essential on board ship, but a ship's power plant and electrical system differ from land-based power systems in several respects: with much less length of wiring, they do not need transformer systems, variations in relative load are greater, and there are problems from vibration, high temperature, salinity and humidity. Generators are commonly of the AC type, and in the 1970's had power-to-tonnage ratios of 1kW/ton or higher. They generally are closed air circuit water-cooled brushless diode-type synchronous generators. Chinese generators operate at 50 Hz, while some ships have generators which operate as high as 400 Hz. Backup generators are generally provided. The systems also include main and supplementary distribution boards to distribute power to the various loads. There are three types: the trunk type, feeder line type and mixed type. There are two types of load: rotating and static. The latter type includes heaters, rectifiers, lighting equipment and the like. Power cables must have special insulation to withstand oil, humidity, heat and flame. Many control functions are now being automated, such as network protection in case of breakdowns, automatic monitoring and the like. The introduction of transistors and microprocessors has greatly improved this technology. In the future, superconductivity may be applied in ship electric systems.

AUTHORS: FU Tongxian [0126 0681 0341], ZHANG Guoliang [1728 0948 5328]

CRG: None

TITLE: "Submarines and Noise"

SOURCE: Beijing JIANCHUAN ZHISHI [KNOWLEDGE OF SHIPS] in Chinese No 8, 20 Nov 80
pp 30-32

ABSTRACT: Noise is the main enemy of concealment for submarines. Subs cannot be detected by radar, but can be located by sonar. Excessive noise produced by submarines can even mask the noise made by other ships. Decreasing noise to one-tenth of a decibel decreases the detection range by half. U.S. submarines even sacrifice speed in favor of a quieter shape and extra money is spent on structural rigidity. Noise is produced primarily by vibration from machinery inside the submarine, by skin friction and by the propeller. Precision machine design and vibration damping systems can decrease engine noise. Skin friction can be decreased by maximizing the smoothness of the hull or by emission of polymers along the hull. Special-design propellers, especially large-diameter low-speed multi-blade types, have lower noise. The main sources of propeller noise are cavitation, tip noise and "singing." Propeller noise can be decreased by using two propellers rotating in opposite directions.

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CSO: 4009

Solar Energy

AUTHOR: ZHANG Ruifeng [1728 3843 1946]

ORG: None

TITLE: "Paper-Thin Solar Cells"

SOURCE: Beijing TAIYANG NENG [SOLAR ENERGY] in Chinese No 2, 1980 p 20

ABSTRACT: The thin-film cadmium sulfide solar cell, the world's thinnest solar cell, has the advantages of large area, light weight, high relative power, good flexibility, simplicity of manufacture, low price and long life. The current maximum conversion efficiency of such cells is 9.5 percent, the maximum current obtainable per square centimeter of surface is 25 milliamperes, and the maximum open-circuit voltage per cell is 450-500 millivolts. The cells have promise as power supplies for spacecraft and as power sources for satellite electric power stations. With lifetimes that may reach 20 years, the devices are useful for many ground-based applications such as aviation safety, weather observation, navigation signal recognition, communications installations, farming, highway traffic control, household applications and the like. By 1982 the price of cadmium sulfide cells may be competitive with that for fossil-fired electric power generation.

AUTHOR: JING Zhili [2529 1807 4409]

ORG: None

TITLE: "Lhasa, the Solar City"

SOURCE: Beijing TAIYANG NENG [SOLAR ENERGY] in Chinese No 2, 1980 pp 23-24

ABSTRACT: Lhasa, which is at a high altitude, has thin air (low water vapor and dust content) and is at a low altitude, with long hours of abundant sunlight, has some of the best solar energy utilization conditions in the country, and solar equipment there has greater efficiency than elsewhere. Double-glazed solar ovens can achieve a temperature of 160° in Lhasa in summer, while in North China their triple-glazed counterparts can achieve only 150°. Because of the thin atmosphere, heat loss from solar collectors is less than in other parts of the country. The devices can be used year round; rain during Lhasa's rainy season generally comes at night. Because fuel (cow manure and sod) is extremely scarce in Tibet, solar power is especially important in the area. The Solar Energy Research Laboratory of the Tibet Scientific and Technical Committee has developed a portable water heater for use in unpopulated areas.

AUTHOR: ZHUO Ru [3820 1172]

ORG: None

TITLE: "Utilization of Solar Energy in Daxing"

SOURCE: Beijing TAIYANG NENG [SOLAR ENERGY] in Chinese No 2, 1980 pp 24-25

ABSTRACT: In Daxing County, near the capital, available bath houses were woefully insufficient to meet public needs. Starting in 1976 the county scientific and technical committee began a project to set up solar water heaters throughout the country. The total collector area is now 5,000 square meters, about one-sixteenth the total collector area for the entire country. These provide baths for about 15,000 people a day, with an estimated saving of more than 3,000 tons of coal per year. A local brigade made its own bricks and built a solar bath house with a collector area of 100 square meters. The county's nitrogen fertilizer plant built a solar bath house with a collector area of 100 square meters, using the collector as the roof of a dormitory. A combined drying, water heating and greenhouse unit has also been developed. Methane production and individual household solar heated baths are also being pursued. The county is cooperating with West Germany in building a model new energy sources village in the county.

AUTHOR: None

ORG: Joint Experimental Group on Solar Seed Raising, Shanxi Province

TITLE: "Pulsed Focused Illumination Devices"

SOURCE: Beijing TAIYANG NENG [SOLAR ENERGY] in Chinese No 2, 1980 pp 26-27

ABSTRACT: In order to pursue experiments in pulse irradiation of seeds, seedlings, pollen and organisms growing in water, various solar focusing and irradiation devices have been developed. They include: 1. A standing model with a 1.7 x 1.5 meter parabolic mirror which focuses sunlight on a rotating screen cage; 2. A long focal length mirror system in which the focused light is reflected by a swinging planar mirror mounted on a separate flexible stand so that it strikes seedlings on the ground intermittently; 3. A hand-carried irradiating mirror with a focal length of 30 cm which can be used for 60 pulse per minute irradiation; 4. A stationary high light gathering power irradiator which focuses sunlight on a cage turned by a pulley system; 5. An irradiation system which uses artificial light, to be employed when sunlight is not available.

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